ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8200.39B

03/03/03

SUBJ: **Flight Inspection of Precision Runway Monitors/ Final Monitor Aid Display Systems**

1. PURPOSE. This order prescribes the procedures for flight inspecting precision runway monitors (PRM) and final monitor aid displays (FMAD).

2. DISTRIBUTION: This order is distributed to the Communication, Navigation, and Surveillance Platform Division of the National Airspace System Implementation Program; to the Terminal Facilities Division of the Terminal Business Service; to the National Operations and NAS Policy Divisions of National Airspace Operations; to the National Airway Systems Engineering Division of Operational Support; to the Director and Deputy Program Director of the Office of Communications, Navigation, and Surveillance Systems; to the En Route/Terminal Operations/Procedures Division of the Air Traffic Planning and Procedures Program; to the Flight Technologies and Procedures Division of Flight Standards Service; to the branch level in the National Flight Procedures Office and Flight Inspection Operations Division of Aviation System Standards; to the division level in the Regional Airway Facilities, Air Traffic, and NAS Implementation Center Divisions; and to all Flight Inspection Field Offices.

3. CANCELLATION. Order 8200.39A, Flight Inspection of Precision Runway Monitors/ Final Monitor Aid Display Systems, dated August 1, 2002, is canceled.

4. BACKGROUND.

a. Order 7110.65, Air Traffic Control, contains the ATC requirements for simultaneous precision approaches.

b. When the approach courses are parallel, the runway spacing between centerlines can be as close as 3,400 ft, provided the no-transgression zone (NTZ) is monitored by a high update rate surveillance system capable of a 1.0 second update interval such as the Precision Runway Monitor (PRM). The parallel runway centerlines can be as close as 3,000 ft if an offset ILS/ MLS/ LDA facility (not meeting localizer siting critiera) of 2.5° - 3.0° serves one of the runways. A simultaneous offset instrument approach (SOIA) is applicable where parallel runway centerlines are from 750 to 3,000 ft apart.

c. A high resolution color monitor with alert algorithms, such as a final monitor aid (FMAD) or that required in the precision runway monitor program shall be used to monitor approaches where:

(1) Triple parallel runway centerlines are at least 4,300 but less than 5,000 ft apart and the airport field elevation is less than 1,000 ft MSL.

(2) Triple parallel approaches to airports where the airport field elevation is 1,000 ft MSL or more require the high resolution color monitor with alert algorithms and an approved FAA aeronautical study.

Distribution: A-W(NI-90/TB-300/OP-100/300/OS-200/ND-1/400/ TP-100/FS-400); A-W(VN-100/200)-3; A-X(AF/AT/NI)-2; A-FFS-4(ALL)

Initiated by: AVN-230

5. EXPLANATION OF CHANGES. Simultaneous Offset Instrument Approach (SOIA) requirements have been added.

6. GENERAL. The PRM and FMAD are air traffic monitoring devices using secondary radar to generate position information for display to the monitor controller. The PRM is a stand-alone secondary surveillance radar and display system and requires a commissioning flight inspection. The FMAD uses ARTS and “Mode S" data to update positioning information.

7. DEFINITIONS/ ABBREVIATIONS.

a. Aircraft Identification (ACID).

b. Automated Radar Terminal System (ARTS).

c. Blunder. An unexpected turn, by an aircraft already established on the localizer, toward the adjacent runway.

d. Coast (CST). When there is a loss of transponder reception, the data block will turn a constant yellow and "CST" will appear in the altitude field of the data block.

e. Coast Drop (CSTD). When there is a loss of transponder reception for a period of 10 seconds, the beacon radar system (BRS) shall drop the track. All of the data block fields will blink yellow and "CSTD" will appear in the alert field of the data block.

f. Final Monitor Aid Display (FMAD). A high resolution color display that is equipped with the controller alert system software/hardware used in the PRM system.

g. Geographical Filter. A filter that inhibits the acquisition and tracking of target reports outside of established geographical filter boundaries.

h. GPS Flight Inspection System (GFIS). A system consisting of a ground and an airborne unit used to evaluate GPS signals. The ground unit receives Global Positioning System (GPS) signals and transmits differential GPS data to the airborne unit. The airborne unit uses airborne and ground GPS data telemetry to perform Differential GPS (DGPS) navigation and GPS inspection functions, providing displays and logged data for post-mission review. The airborne unit may be used independently but with reduced accuracy.

i. IFR Room. Common name for Air Traffic Control Room.

j. Interrogation Blanking Sector. Azimuth blanking sector where the PRM does not interrogate aircraft.

k. Localizer Directional Aid (LDA). A lateral guidance facility which provides localizer-type guidance but does not meet localizer siting/ alignment criteria.

l. Loss of Track. This equates to a coast drop.

m. Monitor Controller. Air traffic controller who continuously monitors aircraft conducting parallel precision approaches.

n. Navigational Error Zone (NEZ). A zone with a minimum width of 2,000 ft located between the final approach courses of adjacent parallel runways, beginning where the no transgression zone (NTZ) ends, and continuing to the service volume limit. The NEZ perimeter on the display presentation shall be outlined in yellow. The navigational error zone is provided on FMAD’s only.

o. No Transgression Zone (NTZ). The region of airspace (2,000 ft wide) located between the extended inbound courses of parallel runways for the purpose of detecting aircraft deviations from an approach along the extended inbound courses. Additional NTZ’s, which may vary in size and shape, may be added within the geographical filter boundary area for the purpose of terrain or airspace avoidance and for noise abatement. The NTZ(s) is included as a site parameter designed for each individual installation.

p. Normal Operating Zone (NOZ). The NOZ is defined as an area, within the runway environment, with a width bounded by its associated NTZ's and a length extending to the end of the longest NTZ on the approach end and the longest NTZ on the departure end.

q. Precision Runway Monitor System (PRM). A stand-alone high update monopulse secondary surveillance radar system that employs an electronically scanned phase array antenna and high resolution CRT monitors.

r. Runway Environment. An area depicted within the video map display that includes the NTZ and NOZ.

s. Simultaneous Offset Instrument Approach (SOIA). SOIA(s) are applicable where parallel runway centerlines are from 750 to 3,000 ft apart. It is a simultaneous approach to one set of parallel runways utilizing a straight-in instrument landing system (ILS) approach to one runway and a localizer type directional aid (LDA) with glide slope instrument approach to the other runway. In SOIA, the approach course separation (instead of the runway separation) meets established approach criteria.

t. Special Position Identification (SPI). An extra pulse which follows the normal pulse train of an aircraft transponder identification, providing a method of identifying the aircraft sending the pulse.

u. Video Map Display. The PRM display coverage area, outlined in blue, defined by the geographical filter data, which represents the site-specific geographical boundaries. Other terminology used to define the video map display is blue polygon or keyhole.

8. FLIGHT INSPECTION REQUIREMENTS.

a. The PRM shall be commissioned in accordance with this order. Periodic inspections will be performed at 540-day intervals, concurrently with the check of the ILS to which an NTZ is associated.

If requested, complete the flight inspection of the FMAD using the procedures outlined in this order. There are no FMAD commissioning or periodic requirements.

b. Aircraft Requirements. GPS positioning and the following transponder modes are required for the type system indicated:

(1) PRM - Modes 3/A and C**.**

(2) FMAD - Modes S, 3/A, and C.

9. FLIGHT INSPECTION PROCEDURES, ANALYSIS, AND TOLERANCES.

a. Appendixes 1, 3, and 4 contain the PRM flight inspection procedures, analysis, and tolerances.

b. Appendix 2 contains the FMAD flight inspection procedures, analysis, and tolerances.

c. Appendix 5 contains instructions for flight inspection reporting.

10. INFORMATION UPDATE. Any deficiencies found, clarifications needed, or suggested improvements regarding the contents of this order should be noted on FAA Form 1320-19, Directive Feedback Information. If an interpretation is needed, call the originating office for guidance; however, you should also use FAA Form 1320-19 as a follow-up to the verbal conversation.

/s/

Thomas C. Accardi
Program Director of Aviation
System Standards

APPENDIX 1. PRECISION RUNWAY MONITORS (PRM)

1. INTRODUCTION. The PRM is a high update mono-pulse secondary surveillance radar system that employs an electronically scanned phased array antenna and high resolution color CRT monitors. The PRM system provides detection, acquisition, tracking, and presentation of aircraft to assist air traffic controllers in monitoring and maintaining the required separation of air traffic on approach to parallel runways.

a. PRM Characteristics.

(1) General. The elevation coverage is from -2° to +31° with respect to a horizontal line passing through the antenna for ranges from 500 ft to 3 nautical miles (nm). The elevation coverage is from +1.5° to +31° with respect to a horizontal line passing through the antenna, extending to a minimum altitude of 15,000 ft, for ranges from 3 nm to 32 nm (See Appendix 3, Figure 1).

(2) PRM/FMAD Display Presentation. The display presentation (see Appendix 3, Figure 3) will provide the necessary information and alerts to properly assess the condition on the runway approaches and intervene as necessary. The display presentation shall consist of alphanumeric and graphic data on a CRT screen.

(3) Target Symbols and Data Block Fields. Appendix 3, Figure 4 gives a close-up view of a target and common symbols found on the PRM/FMAD display. Each tracked symbol shall have an associated data block. The data block layout (Appendix 3, Figure 4) illustrates what information can be included in the data block.

2. PREFLIGHT REQUIREMENTS. Complete the applicable preparations in FAA Order 8200.1, Section 106.

3. FLIGHT INSPECTION PROCEDURES. Flight inspection of the PRM will define the recognition accuracy provided to the monitor controller and coverage of the system.

4. DETAILED PROCEDURES.

a. Checklist for PRM Flight Inspection. The following checklist items shall be performed on all runways associated with the PRM.

Type Check	Reference Paragraph	Commissionings	Periodic
Modes/Codes	Appendix 1, 4b(2)	X	
Transponder Check	Appendix 1, 4b(3)	X	X
Usable Distance	Appendix 1, 4b(4)b	X	
Inbound Courses and NTZ Boundary Display Accuracy	Appendix 1, 4b(4)c	X	
Altitude Boundary	Appendix 1, 4b(4)a	X	
NTZ Boundaries (outside the runway environment) and Video Map Display Boundaries (when present)	Appendix 1, 4b(5)	X	
Approach/Missed Approach	Appendix 1, 4b(6)	X	X
Low Altitude Coverage	Appendix 1, 4b(6)	X	X
Communications	Appendix 1, 4b(7)	X	X

b. PRM Flight Checks.

(1) General. Appendix 3, Figures 2, 5, and 5A illustrate how the PRM and the No Transgression Zones (NTZ) could be utilized. The NTZ is the area where the aircraft is prohibited from entering. The runway NTZ is normally 2,000 ft wide and located equidistant between inbound courses. The Normal Operating Zone (NOZ) (see Appendix 3, Figure 3) is the area around each inbound course that is not part of the NTZ. The range and shape of the NTZ's are site variable. The range of the NTZ, used between runways, is normally determined by the runway with the furthest glide slope intercept (GSI) used on the simultaneous approaches (see Appendix 3, Figure 6). This range will determine the beginning of the NTZ, and it will extend to one-half mile beyond the departure end of the runway. For SOIA(s), the NTZ terminates at the MAP of the localizer-type directional aid (LDA) approach. Other NTZ's may be located anywhere within the PRM service volume, be of various shapes, and have site-specific altitude boundaries. Some NTZ's may be vertically stacked, allowing a corridor for flight between the NTZ areas.

(a) If an aircraft gets within 10 seconds (a projected alert) of entering the NTZ, the monitor controller will receive an audible alert "[ACID] deviating" where [ACID] is the aircraft's identification. In addition, the monitor controller will get an NTZ alert in the alert field of the target data block plus the data block will turn yellow (see Appendix 3, Figure 7). The monitor controller will issue heading instructions to return the aircraft on course. For NTZ's designed for areas outside the runway environment (see Appendix 3, Figure 2), the monitor controller will issue heading and/or altitude instructions to the deviating aircraft to avoid entry into the NTZ.

(b) If the aircraft still enters the NTZ, the monitor controller will receive a blinking red NTZ alert in the alert field of the target data block (see Appendix 3, Figure 8). When this happens within the runway environment, the aircraft on the other approach shall be issued breakout instructions.

(c) When an emergency code is received, the alert field of the associated target's data block will contain the appropriate blinking red acronym (see Appendix 3, Figure 9).

(2) Modes and Codes

(a) Purpose: To verify the proper decoding of ATCRBS reply pulses. Facilities maintenance personnel shall ensure that all modes and codes are verified by equipment test procedures before requesting flight inspection. Codes 7500, 7600, and 7700 should not be used due to the possibility of alarming other facilities.

(b) Approved Procedure. Facilities maintenance personnel shall monitor the flight inspection aircraft transponder replies or targets-of-opportunity throughout the coverage area of the video map display. During these tests, facilities maintenance personnel should request the flight inspection aircraft use different modes or codes to sample various modes and code trains. When targets-of-opportunity are used, ensure that the sample contains all modes interrogated and a sufficiently large sample of codes to ensure correct decoding of beacon replies.

(3) Transponder Check. The purpose of this check is to verify the PRM displays the proper alert to the monitor controller. This check will simulate a transponder loss and verify the PRM provides the monitor controller with the proper alerts (aural and/or visual) to detect track loss. When the track loss is detected, the monitor controller will receive a coast "CST" alert in the alert field of the data block. This check is only required for NTZ's located between the runways.

Approved Procedure. Fly inbound on course at Glide Slope Intercept altitude (GSI). Turn the aircraft transponder off. Request the monitor controller respond when a coast "CST" alert is received in the alert field of the data block. Turn the transponder back on.

Evaluation. Verify the monitor controller receives the proper alert.

(4) Altitude Boundary, Usable Distance, Inbound Courses, and NTZ Boundary Display Accuracy. These checks shall be accomplished based on the operational requirements of the specific facility under evaluation. The service volume for the PRM/FMAD presentation is defined by the geographical filter data which is software generated. The width and altitude boundaries of the service volume are site variable, and this information is available on the PRM Data Sheet.

The PRM video map display, defined by the geographical filter, may be displayed using a portion of the usable system service volume as illustrated in Appendix 3, Figure 3, or the entire system service volume (see Appendix 3, Figure 2). The video map display boundaries, as defined by the geographical filter, are outlined in blue on the PRM/FMAD display presentation (see Appendix 3, Figures 2 and 3). There could be more than one video map display and NTZ presentation at one location. Typically a presentation for the opposite runway ends would be present (see Appendix 3, Figure 15). Additionally, there could be more than one configuration of the video map display and NTZ(s) at a runway end (see Appendix 3, Figure 16).

The altitude boundary of the NTZ(s) may be defined in a step configuration (see Appendix 3, Figure 11) to satisfy operational requirements. The geographical filter may be configured to filter out all transponder data that is not within the video map boundaries, or it can be configured to track a limited number of tracks outside of the video map boundaries.

(a) Altitude Boundary (Video Map Display and No Transgression Zones Altitude Boundaries). This check is required to verify that the altitude defined by the geographic filter is accurate. When the altitude boundaries of the NTZ(s) are in a stepped configuration (see Appendix 3, Figure 11), the altitudes of each portion shall be evaluated individually.

Approved Procedure (see Appendix 3, Figure 11). The altitude boundary check for the video map display and the NTZ may be flown anywhere within the defined service volume that encompasses both the video map display and the NTZ. Within the video map display/NTZ boundary, fly 500 ft below the defined coverage altitude. Climb until the monitor controller reports exiting the video map, or 500 ft above the video map boundary, whichever occurs last. Descend until the monitor controller reports re-entry into the video map, or 500 ft below the video map boundary, whichever occurs last. Enter and exit the boundary as many times as feasible (minimum of 2) within the distance defined (maintain a vertical speed of less than 500 ft per minute.) Request the monitor controller report both the exiting and re-entering of the coverage area. Request the monitor controller be as accurate as possible.

Evaluation. Note the MSL altitude each time when exiting the coverage area.

(b) Usable Distance Check. Limits of requested service volume will be evaluated by flying inbound or outbound to enter or exit the video map boundary. The usable distance check shall be accomplished with the flight inspection transponder power output and receiver sensitivity set to “Low/Low”.

Approved Procedure. Fly inbound/outbound on course of a reference localizer at the GSI altitude, or 500 ft above the highest terrain or obstruction. Request the monitor controller report when exiting or entering the video map boundary.

Evaluation. Usable distance is satisfactory when there is no loss of track, as defined by the video map display boundaries. Only one usable distance check is required, unless additional checks are requested.

(c) Inbound Courses and NTZ Boundary Accuracy. This check is performed to verify the accuracy of the presentation of the inbound courses and NTZ boundaries that are located between the runways. For NTZ(s) which are defined by 6 or more points (see Appendix 3, Figure 5A, Example 7), the accuracy of the NTZ boundaries located in the immediate vicinity of and between the runways will be verified using ground methods. This check will be accomplished by the Surveillance Systems Engineering Branch, AOS-230, or designee.

Approved Procedure (Appendix 3, Figures 12 and 13). Complete the check in ILS-1 mode. Verify the course width of each localizer is $\pm$ 0.10° of the commissioned width. A wide course width, combined with misalignment of the localizer course could affect the inspection results of the PRM presentation. Optimization of both the localizer course width and alignment is required to provide an accurate analysis of the PRM presentation. (Any altitude within the localizer service volume may be used). Complete one ILS-1 arc clockwise and another arc counter-clockwise at a distance of 5 nm or beyond. Fly the crossing at a minimum practical airspeed to allow the monitor controller/ technician enough response time for marking required points. Request the monitor controller report when the aircraft crosses each inbound course and when entering and exiting the NTZ or Navigational Error Zone (NEZ) boundary. Request the monitor controller use the phrase, "Ready, Ready, Mark" to facilitate accurate marking of the inbound courses and NTZ boundaries. The technician shall mark each received call on the recording, using the event mark. Fly the clockwise and counter-clockwise ILS-1 arcs at two distances separated by at least 1 nm. When checking dual runways, use the right-side localizer (as seen flying inbound) for the reference localizer (see Appendix 3, Figure 12).

When checking triple runways, complete the above procedure twice, using the right-side localizer (as seen flying inbound) as the reference localizer for both checks (see Appendix 3, Figure 13). In this example, fly the arcs for Rwy 16 and 17R, using Rwy 16 as the reference localizer, then fly Rwy 17R and 17L, using Rwy 17R as the reference location.

Although the distances between each measured point (inbound courses and NTZ boundaries) are normally provided in ft or nautical miles, they will be converted to degrees for this analysis.

This is because the flight inspection (FI) marks are provided in degrees in ILS-1 mode and will be used as references when evaluating the degrees off course.

Evaluation. The PRM Excel® Workbook provides worksheets and tolerances required to analyze the accuracy of the map presentation. The workbook is available through the Aircrew Information File (AIF) and/or the Flight Inspection Technical Evaluation Branch, AVN-210. It shall be used for all inbound courses and NTZ Boundary Accuracy checks of the PRM.

NOTE: The ILS-1 distances flown for each set of CW and CCW arcs must be entered separately into the PRM Facility Data Worksheet, Appendix 4, Figure 1, under the ILS-1 Distance (Cell G2). This entry will initiate a new calculation of the expected degrees off course for each measured boundary and will be displayed on the PRM Facility Data Worksheet, Appendix 4, Figure 1 in Cells C25, E25, F25, and G25. Average the degrees off course of the CW and CCW arcs at each distance flown. Compare the results of the average degree displacement to the expected values in Cells C25, E25, F25, and G25.

(5) NTZ Boundaries or Video Map Display Boundaries (when presented). This check is for NTZ boundaries that are not located within the runway environment (see Appendix 3, Figure 2) and video map display boundaries (when presented). The latitude/longitudes of the corner-posts of the video map/NTZ boundaries are site variable, and this information shall be obtained from the PRM Data Sheet. Some facilities will not have video map width boundaries (outlined in blue), as depicted in Appendix 3, Figure 12, and will not require this portion of the check.

Some PRM applications will require uniquely shaped NTZ’s, based on operational requirements (see Appendix 3, Figure 5A, Example 6, and Figure 2). Other facilities could be sited with one or more NTZ areas beyond the runway environment for varied purposes, such as noise abatement, terrain, or airspace avoidance. This check shall be accomplished based on operational requirements as determined by air traffic control. The boundaries of the video map display (when present) and one or more of the NTZ’s will be evaluated to provide confidence in the accuracy of the map presentation. There is no requirement to check all of the NTZ’s, unless Air Traffic deems it necessary.

Use the Automated Flight Inspection System (AFIS) GPS Non Precision Mode or the GPS Flight Inspection System (GFIS) airborne unit, when available. AFIS is the preferred method of evaluation.

(a) GPS Flight Inspection System (GFIS). The latitude/longitude of the corner-posts defining the video map display/NTZ boundary(ies) will be available on the PRM Data Sheet. Calculate the latitude/longitudes to the nearest thousands of a minute for the points 2 nm prior and beyond the corner-posts for each leg that defines the video map display/NTZ boundaries using the PRM Excel Workbook program. The 2 nm points will define the Initial Approach Fix (IAF) and the Intermediate Fix (IF) (See Appendix 3, Figures 14 and 17). The pilots shall enter a flight plan using the calculated IAF and IF for each leg of the video map display/NTZ boundary which will be flown (FMS/GPS Course Deviation Indicator (CDI) scale sensitivity shall be set to approach scale). The technician shall enter a flight plan into the GFIS airborne laptop unit IAW TI 4040.57 (current version), using the calculated IAF and IF for each leg of the video map display/NTZ boundary which will be flown.

Approved Procedure. This check may be flown at any altitude within the service volume of the video map display. The pilot will fly the track along the video map or NTZ boundary (fly at a reduced speed to allow the monitor/controller technician enough response time for marking the required points). The monitor controller will verbally report each time the aircraft is centered on the boundary. Request the monitor controller report, using the phrase, "Ready, Ready, Mark" to facilitate accurate marking. The technician shall record the file number of each run and actuate an event mark at each monitor controller report.

Evaluation. When using the GFIS airborne unit, the technician shall use the ground workstation program IAW TI 4040.57. Display “TIME, XTK PRSNT (cross-track present), and EVENT” on the “GPS NP (non-precision) Monitor Page” of the GFIS for analysis of each leg of the NTZ boundary. For commissioning inspections, retain the GFIS disk along with the recordings. Document the present cross-track result (XTK PRSNT) of all event marks on each leg flown.

(b) Automated Flight Inspection System (AFIS) GPS Non-Precision Mode (GPS NP). The latitude/longitude of the corner-posts defining the video map display/NTZ boundary(ies) will be available on the PRM Data Sheet. Calculate the latitude/longitudes to the nearest thousands of a minute for the points 2 nm prior and beyond the corner-posts for each leg that defines the video map display/NTZ boundaries using the PRM Excel Workbook program. The 2 nm points will define the IAF and the IF (See Appendix 3, Figures 14 and 17). The pilot shall enter a flight plan using the calculated IAF and IF for each leg of the video map display/NTZ which will be flown (FMS/GPS Course Deviation Indicator (CDI) scale sensitivity shall be set to approach scale.) The pilot will transfer the flight plan to the technician's Liquid Crystal Display Unit (LCDU) where the technician will designate the waypoints as "IAF" and "IF". On the NAV TEST CTRL page, toggle the runway fix control to "PLT". The technician will record each leg of the boundary using AFIS GPS non-precision mode and plot as a minimum the RXTK, RXER, number of satellites tracked, and ground speed traces.

Approved Procedure. This check may be flown at any altitude within the service volume of the video map display. The pilot will fly the track along each leg of the video map display/NTZ boundary (fly at a reduced speed to allow the monitor controller/ technician enough response time for marking the required points). The monitor controller will verbally report each time the aircraft is centered on the boundary. The technician will actuate an event mark at each report. Request the monitor controller report, using the phrase, "Ready, Ready, Mark" to facilitate accurate marking.

Evaluation. Document the cross-track results (RXTK) of all event marks on each leg flown.

(6) Approach/Missed Approach/Low Altitude Coverage. The approach will be verified by flying the published approach and missed approach procedure. The low altitude coverage will be verified by conducting a low approach from the runway threshold to the runway end at 50 ft AGL.

Approved Procedure. Conduct an ILS-3 and verify the localizer alignment is $\pm$ 3µA ($\pm$ 5µA for LDAs), If the alignment is not within $\pm$ 3µA ($\pm$ 5µA for LDAs), have maintenance adjust the alignment and complete another ILS-3.

The pilot shall fly the published approach and missed approach. The monitor controller will report each fix (FAF, LOM, etc.), when present, to the pilot as the fix is transitioned. Request the monitor controller report when the track is displayed on centerline throughout the approach. The technician shall mark the recording with an event mark when the monitor controller reports on centerline. Cross the threshold at 50 ft AGL, and then conduct a low approach at 50 ft AGL from the runway threshold to the runway end.

Evaluation. The pilot will determine from the controller reports if the fixes (when present) are displayed accurately on the video map. Average the results of the centerline marks, provided by the monitor controller, from 1 nm from the missed approach point to the missed approach point to determine the alignment of the centerline presentation. Verify from the monitor controller there is no loss of track (coast drop “CSTD”) throughout the approach. If there is a loss of track at 50 ft AGL, fly the low altitude approach again at 100 ft AGL from runway threshold to the runway end. If there is a loss of track at 100 ft AGL, continue checking incrementally as requested by engineering personnel, or up to the limit of the service volume altitude as defined by the geographical filter, to determine if and at what altitude the track coverage is regained. Provide this information to the appropriate operations and engineering personnel. When there is a loss of track at 100 ft or above, the PRM is unusable and cannot be commissioned unless a waiver is granted by Flight Standards Service Technical Programs Division.

(7) Communications. To avoid blocked transmissions, each runway will have a primary and a monitor frequency. The tower controller and monitor controller will have the capability to transmit on both frequencies. Pilots will <u>ONLY</u> transmit on the primary frequency but will listen to both frequencies. The monitor controller has the capability of overriding the tower controller. If a breakout is initiated by the monitor controller and the primary frequency is blocked by another transmission, the breakout instructions may be heard on the second frequency. This check will verify the override capability.

Approved Procedure. Transmit to the tower on the primary frequency. Request the monitor controller exercise the override capability and transmit a test message. It is important that the volume is set at about the same level on both radios so that the pilots will be able to hear transmissions on at least one frequency if the other is blocked.

Evaluation. Verify the test message is heard on the monitor frequency.

Tolerances

Parameter	Reference	Tolerance/Limit
1. Modes/Codes	Appendix 1, 4b(2)	Each code shall generate the proper alert in the appropriate alarm field of the track data block.
2. Transponder Check	Appendix 1, 4b(3)	Proper alert "CST" shall be detected and displayed in the track data block. Verify the monitor controller receives the proper alert.
3. Usable Distance	Appendix 1, 4b(4)b	Satisfactory when there is no loss of track as defined by the site specific video map boundary and meets ATC requirements.
4. Inbound Courses and NTZ Boundary Accuracy (within the runway environment)	Appendix 1, 4b(4)c	Shall not exceed ± 200 ft from the desired boundary position.
5. Altitude Boundary	Appendix 1, 4b(4)a	Within ± 125 ft of the altitude displayed in the cockpit.
6. NTZ Boundaries (not within runway environment) and Video Map Display boundaries (when present)	Appendix 1, 4b(5)	Shall not exceed ± 500 ft from the desired boundary position.
7. Approach/Missed Approach	Appendix 1, 4b(6)	Fixes (if present) shall be displayed accurately on the video map as determined by the pilot from the controller reports. ILS-3 localizer alignment and monitor controller provided centerline marks shall be comparable (within ± 15 µA).
8. Low Altitude Coverage	Appendix 1, 4b(6)	Satisfactory when there is no loss of track throughout the runway environment (threshold to runway end): a. Unrestricted – no loss at 50 ft (all categories of aircraft). No loss at 100 ft (Category I only). b. Restricted – Loss of track at 50 ft. Restricted to CAT I weather minimums only. c. Unusable – Loss of track at or above 100 ft
9. Communications	Appendix 1, 4b(7)	Satisfactory when override capability provides ability to transmit message that is clear and readable.

APPENDIX 2. FINAL MONITOR AID DISPLAY

1. INTRODUCTION. The Final Monitor Aid Display (FMAD) uses a high resolution monitor display unit and built-in software similar to the PRM. The FMAD relies upon the ARTS and mode "S" transponders to provide position information to the system. The FMAD would normally supplement the air traffic monitoring procedures already in place for simultaneous ILS/MLS approaches with parallel runway centerlines separated by at least 4,300 ft but less than 5,000 ft.

2. FLIGHT INSPECTION PROCEDURES. An FMAD does not require a commissioning or periodic flight check. Engineering support may be requested by air traffic or maintenance to evaluate specific parameters. When requested by engineering or maintenance to complete specific support checks of the FMAD, use the procedures described in Appendix 1 (PRM).

3. TOLERANCES. PRM tolerances shall apply (Appendix 1).

APPENDIX 3. FIGURES AND DRAWINGS

Figure 1

PRM SYSTEM COVERAGE

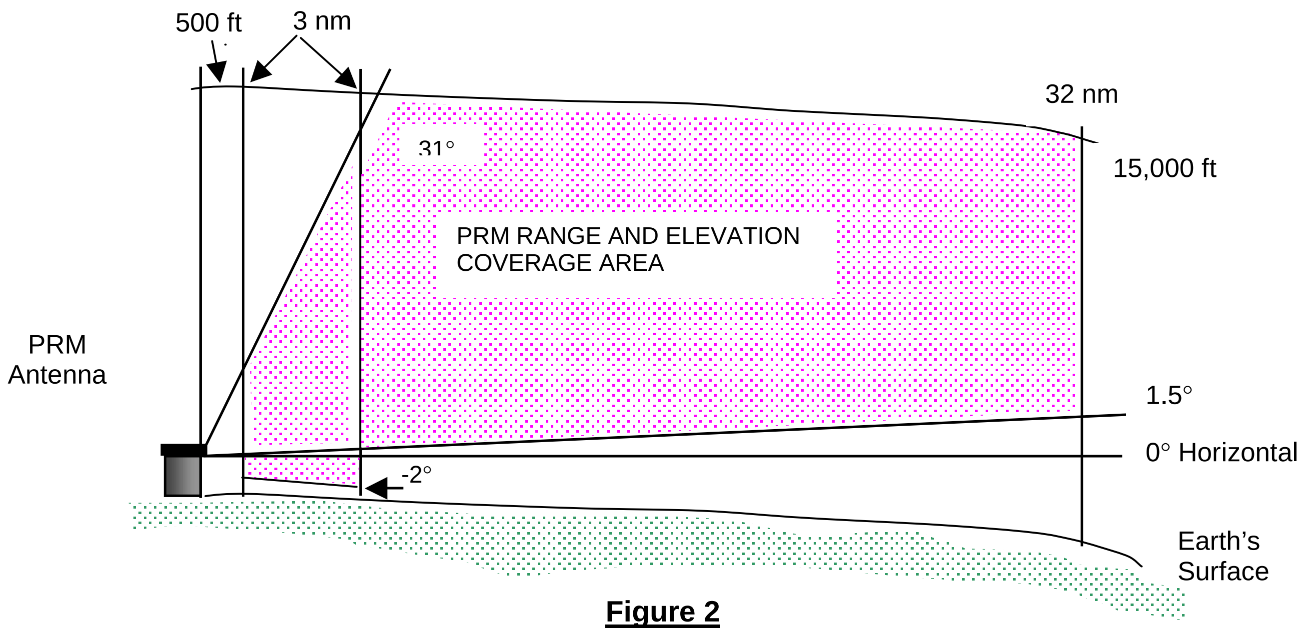


Figure 2

PRM GEOGRAPHICAL FILTER SERVICE VOLUME CAPABILITY WITH MULTIPLE NTZ'S PLOTTED

(Example not to scale.)

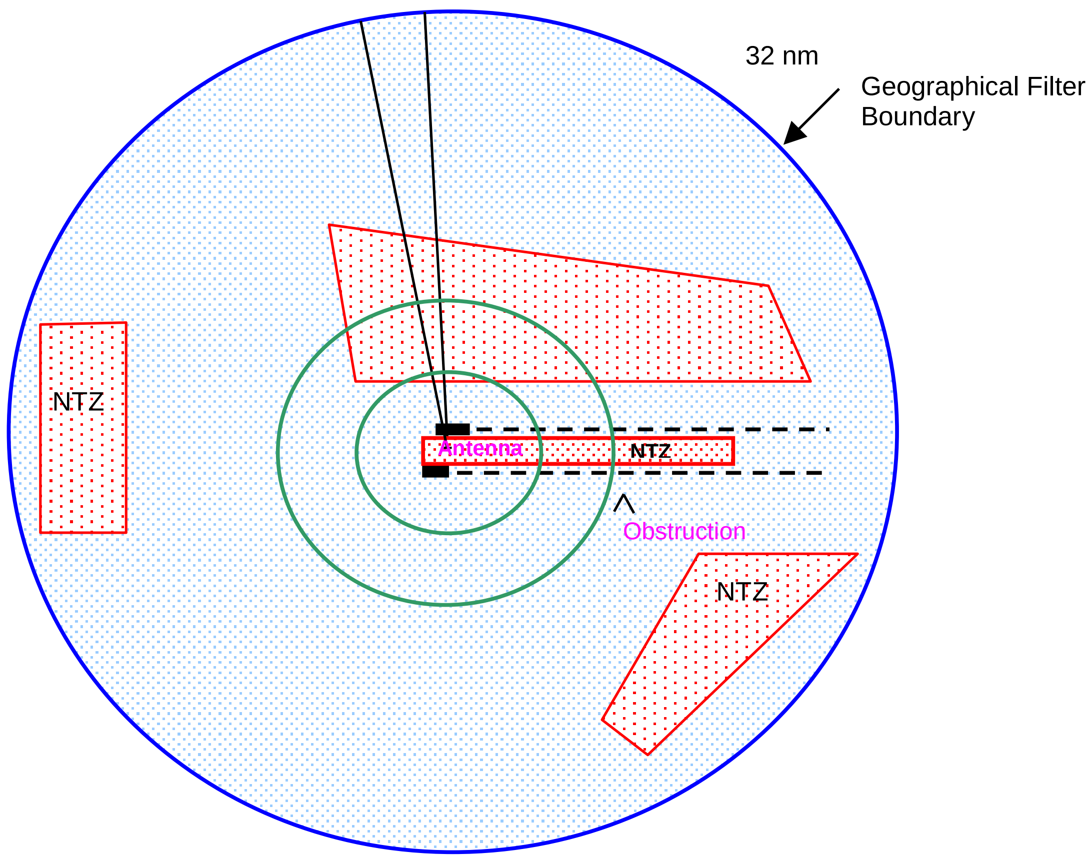


Figure 3

PRM/FMAD DISPLAY PRESENTATION

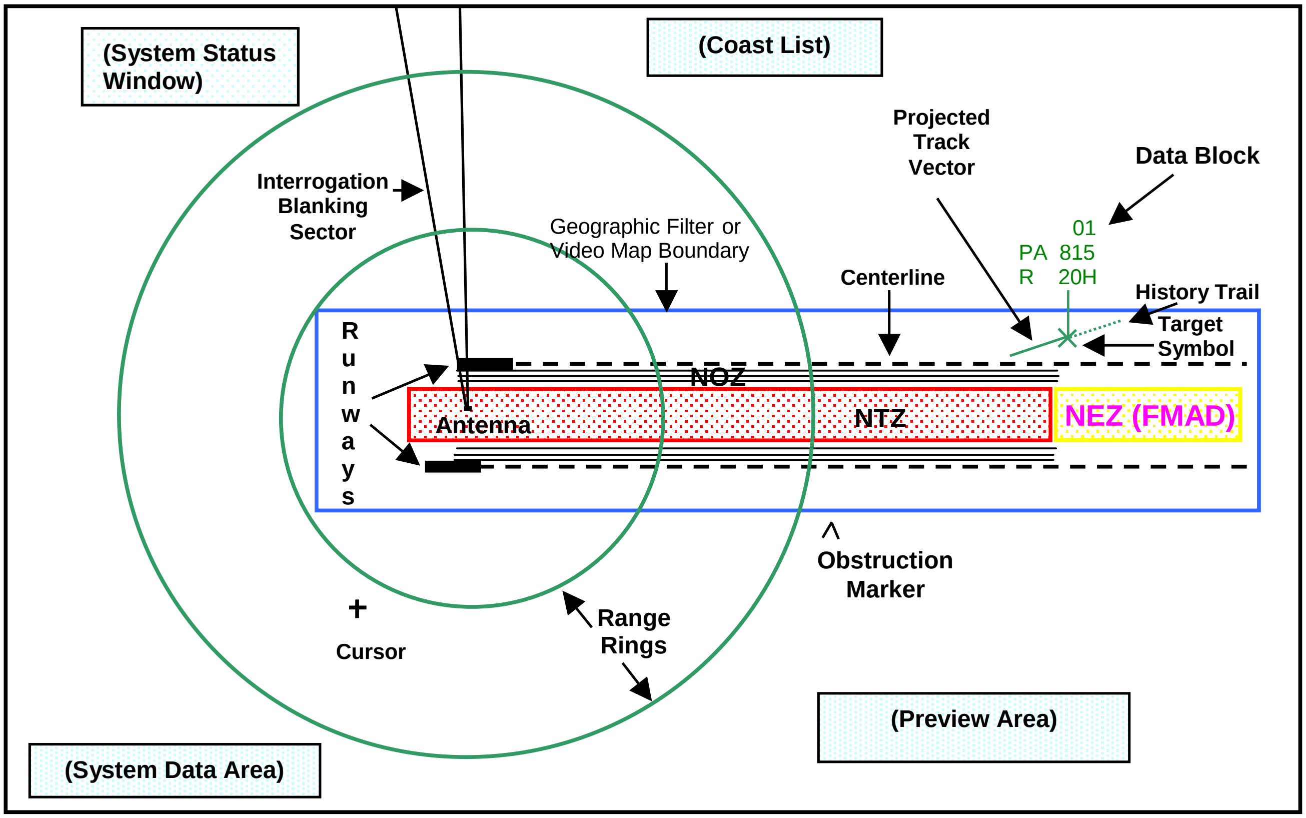
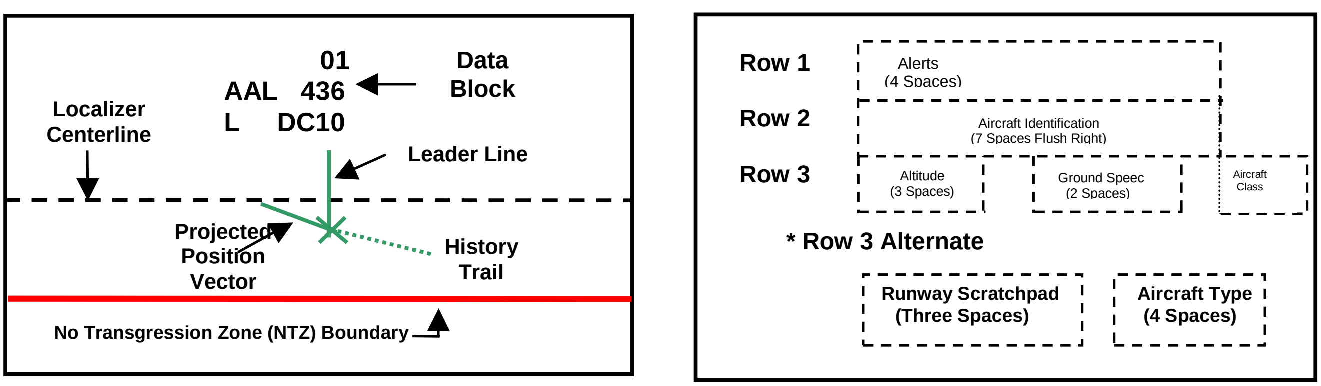


Figure 4

TRACK SYMBOLS AND DATA BLOCK FIELDS

DATA BLOCK LAYOUT



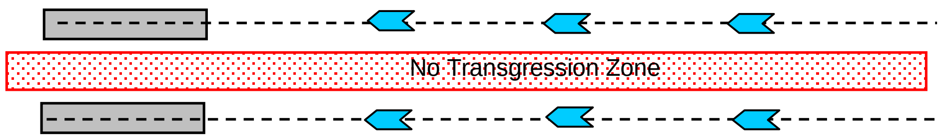
TRACK SYMBOLOGY

PARROT	▲	VFR WITH MODE C	□
TEST	■	DISCRETE NO MODE C	+
VFR NO MODE C	△	DISCRETE WITH MODE C	⚹

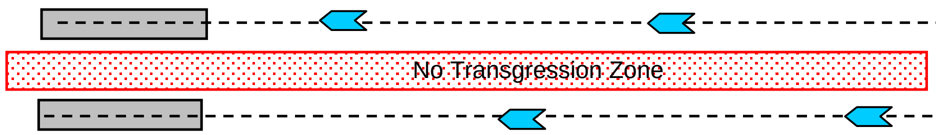
Figure 5

POSSIBLE PRM APPLICATIONS

1. Independent Parallel Runway Monitoring



2. Dependent Parallel Runway Monitoring



3. Segregated Departures and Landing on Closely Spaced Parallels

4. PRM display configuration with a simultaneous offset instrument approach (SOIA

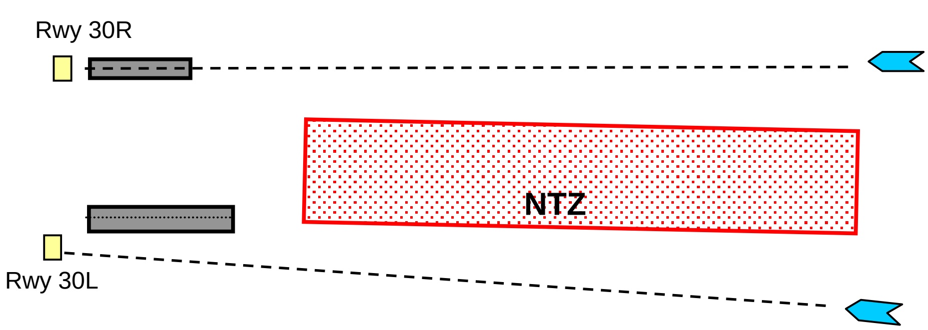
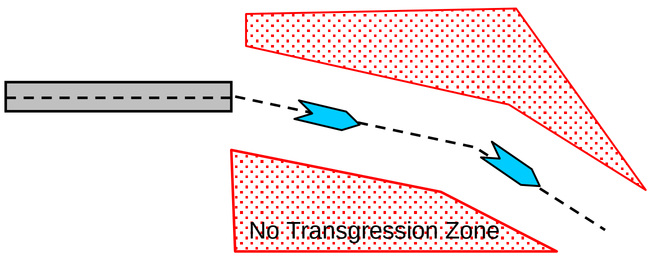


Figure 5A

POSSIBLE PRM APPLICATIONS (continued)

5. Independent Parallel Operations to Triple or Quadruple Parallel Runways

6. Departure Monitoring to Avoid Noise Sensitive or High Risk Areas



7. PRM Display Configuration with 2.5 Degree Offset Localizer

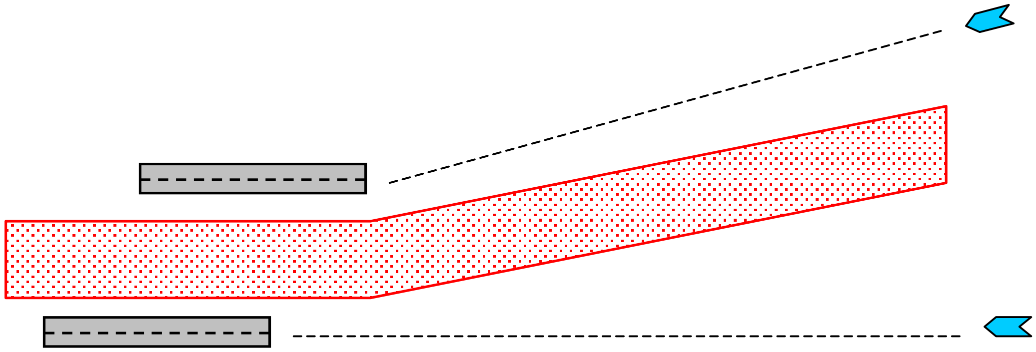
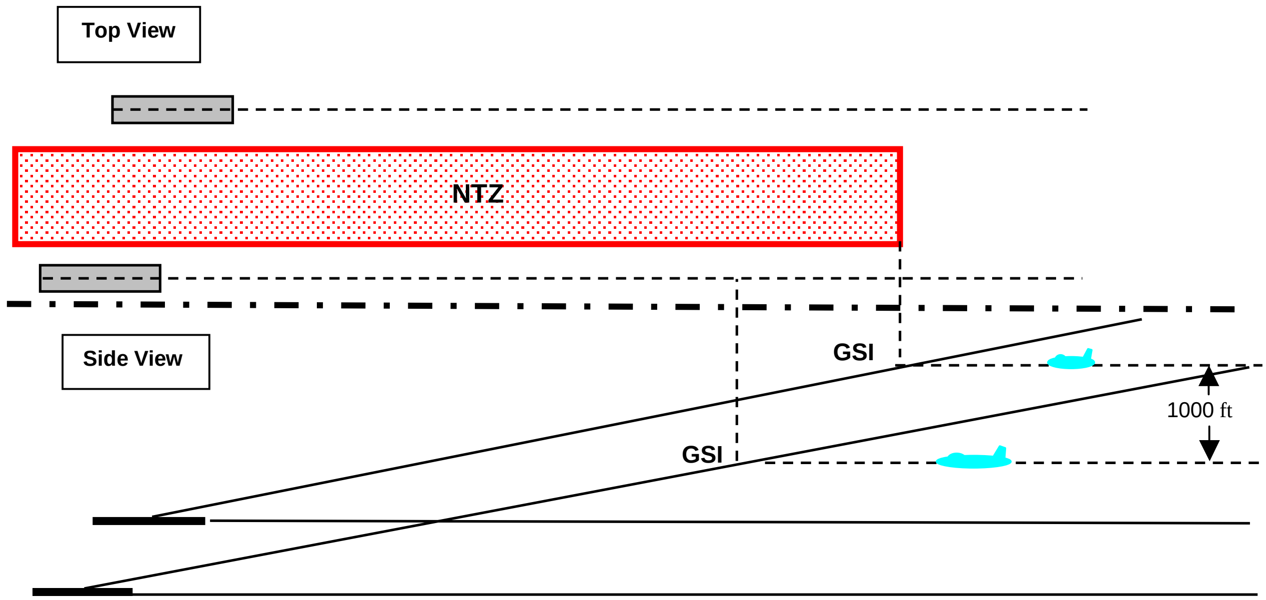


Figure 6

DETERMINING THE NTZ RANGE



The length of the NTZ is determined by the runway with the furthest glide slope intercept (GSI) used on the simultaneous approaches. Air traffic has a 1000 ft vertical separation requirement prior to GSI.

Figure 7

AIRCRAFT PROJECTED ALERT

A projected alert shall be generated when an assigned track's projected position indicates that the aircraft will enter the NTZ within 10 seconds. When a projected alert is generated, the following audible voice message shall be generated, "[ACID] DEVIATING", where [ACID] is the aircraft's identification.

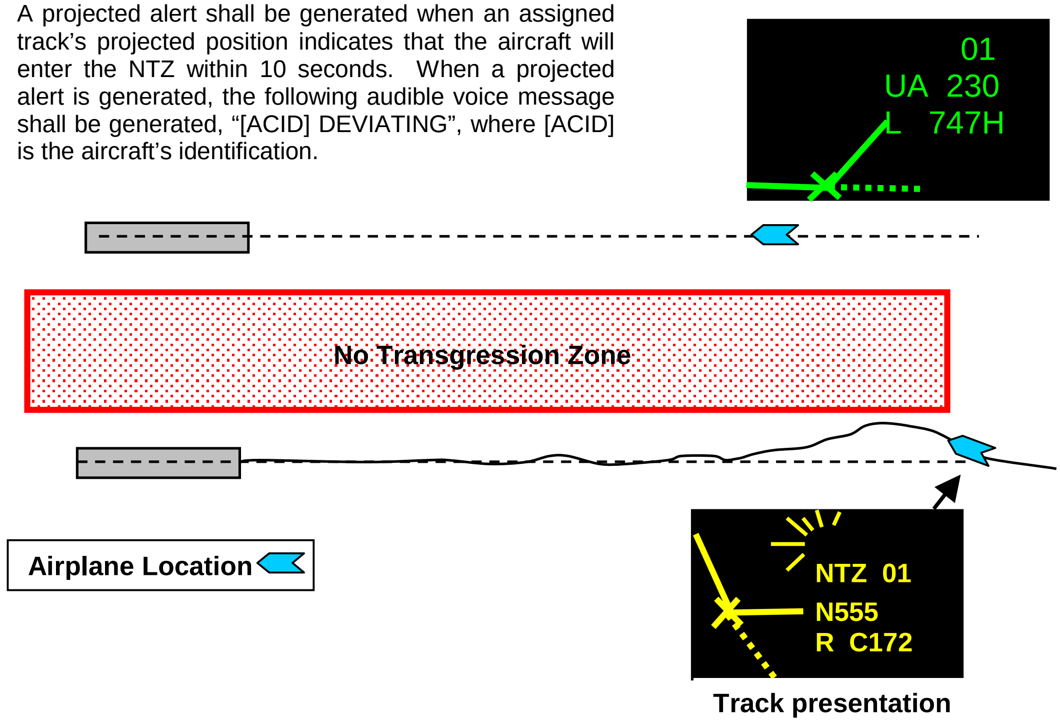


Figure 8

AIRCRAFT ENTERS THE NTZ

If an aircraft enters the NTZ, the monitor controller will receive a blinking red NTZ alert in the alert field of the data block, and the target will turn red. When this happens, the monitor controller will instruct the aircraft on the adjacent final approach to alter course to avoid the deviating aircraft.

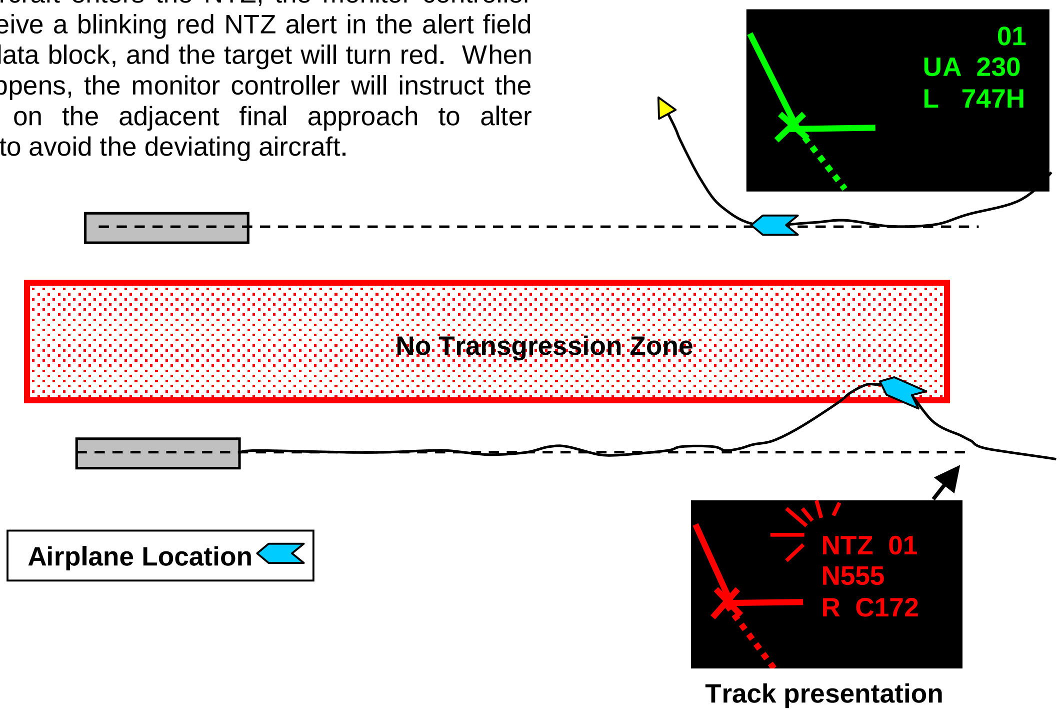


Figure 9

TRANSPONDER CODES

Transponder codes 7500, 7600, and 7700 will cause a red blinking alert and one of the following acronyms will appear in the alert data block field:

RF 7600 Radio Failure
EM 7700 Emergency
HJ 7500 Hijacking

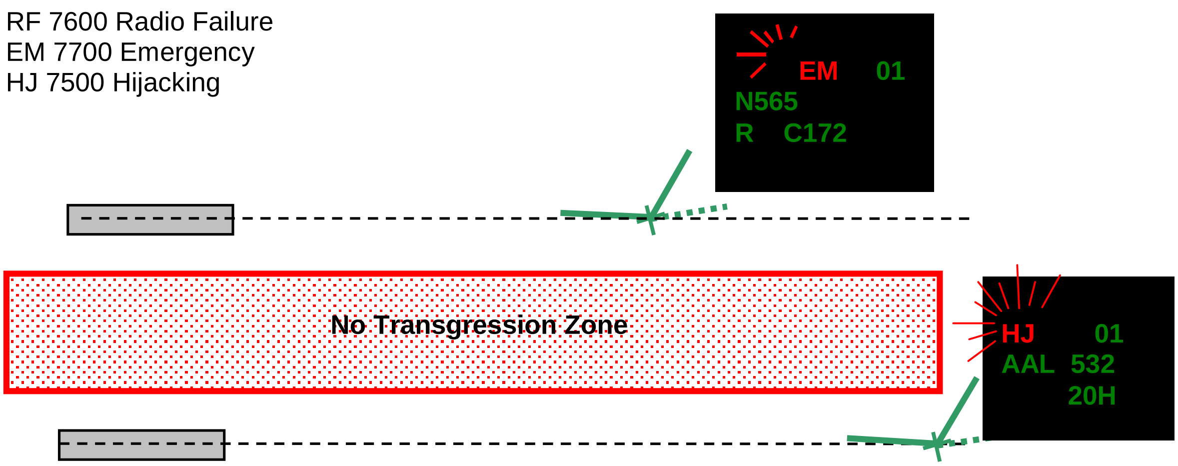


Figure 10

TRANSPONDER CHECK

Fly inbound on course at glide slope intercept altitude (GSI). Turn the aircraft transponder off and verify the monitor controller receives a coast alert. Turn the transponder back on.

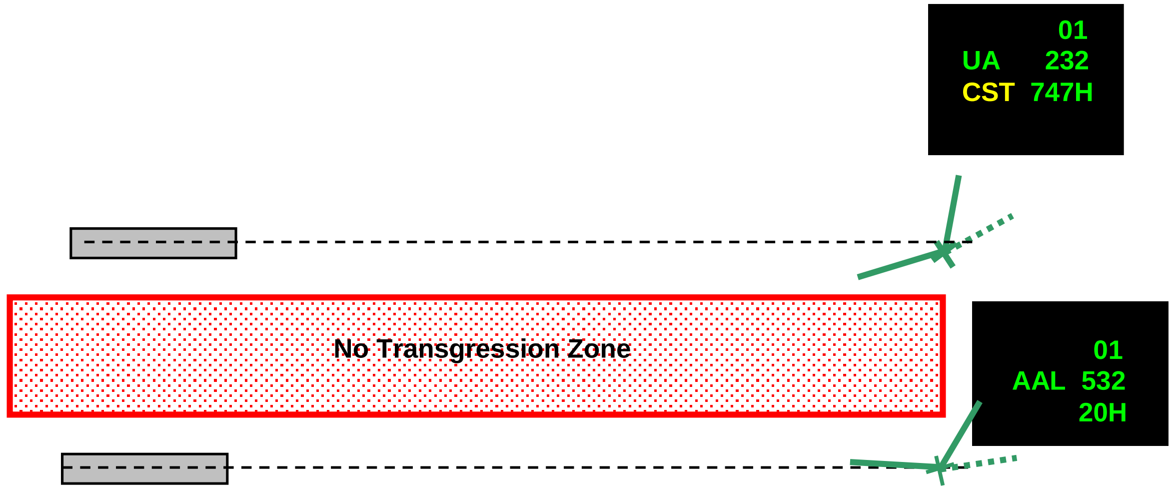
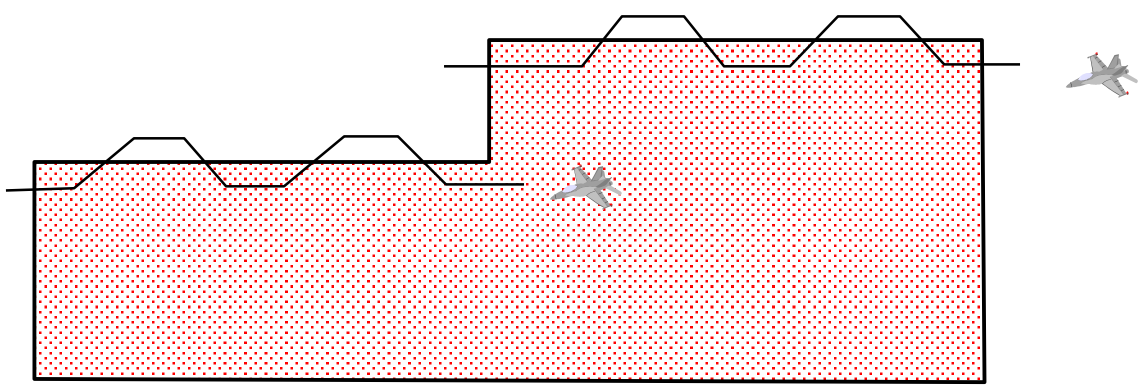


Figure 11

ALTITUDE COVERAGE CHECK

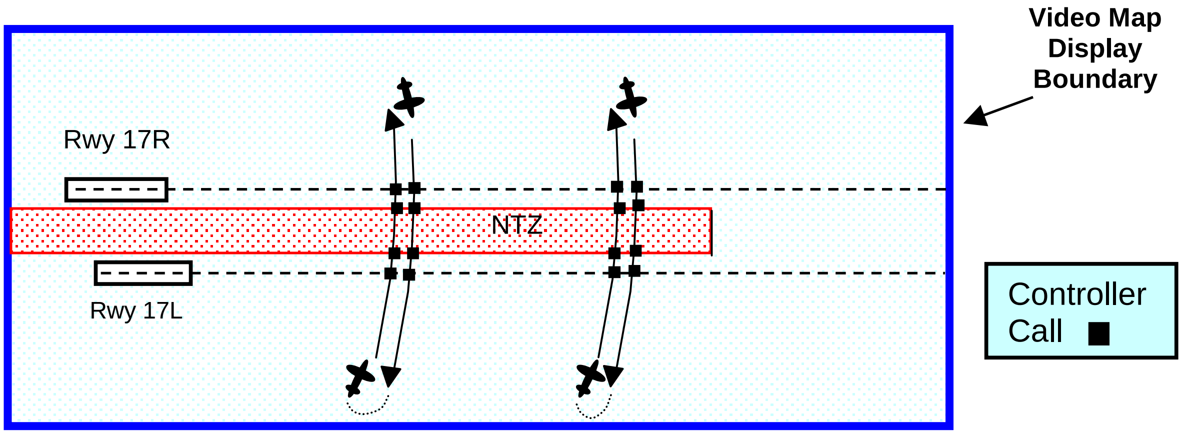
Video Map and NTZ Altitude Boundaries



Checking Altitude Coverage (Mode C): When the altitude boundaries of an NTZ are designed in a stepped configuration, the altitudes of each portion shall be evaluated individually. Enter and exit the boundary as many times as feasible within the distance defined.

Figure 12

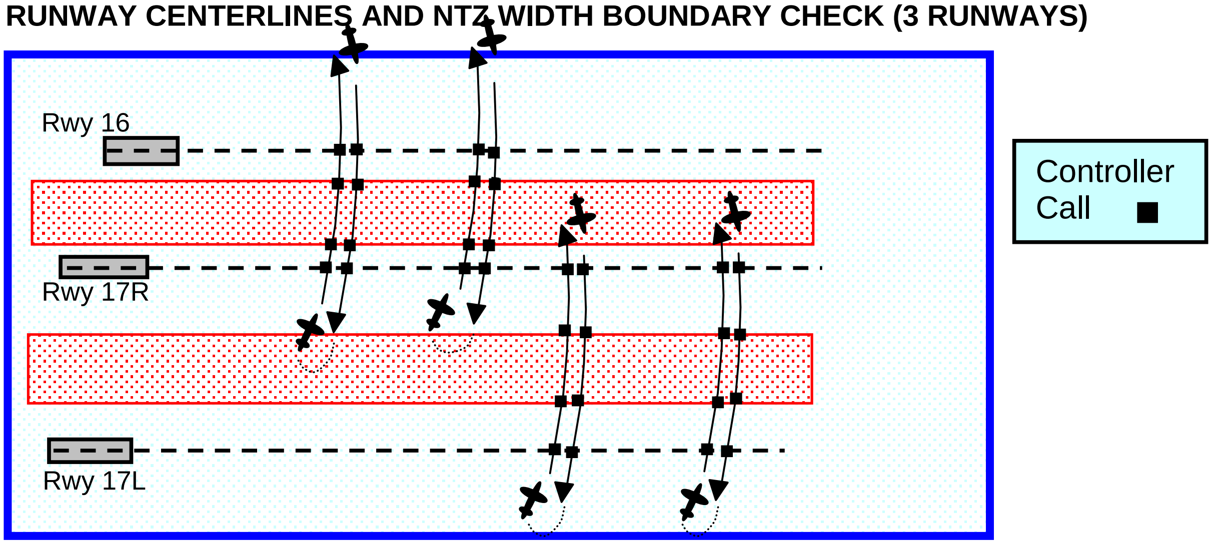
RUNWAY CENTERLINES AND NTZ WIDTH BOUNDARY CHECK (2 RUNWAYS)



Using ILS-1 mode, complete an arc CW and CCW (5 nm or beyond). Request the monitor controller give calls when the airplane crosses the centerline of each localizer and at the entry and exit of each NTZ. Mark each monitor controller call on the recording with an event mark. Conduct the CW and CCW arcs at two distances.

Figure 13

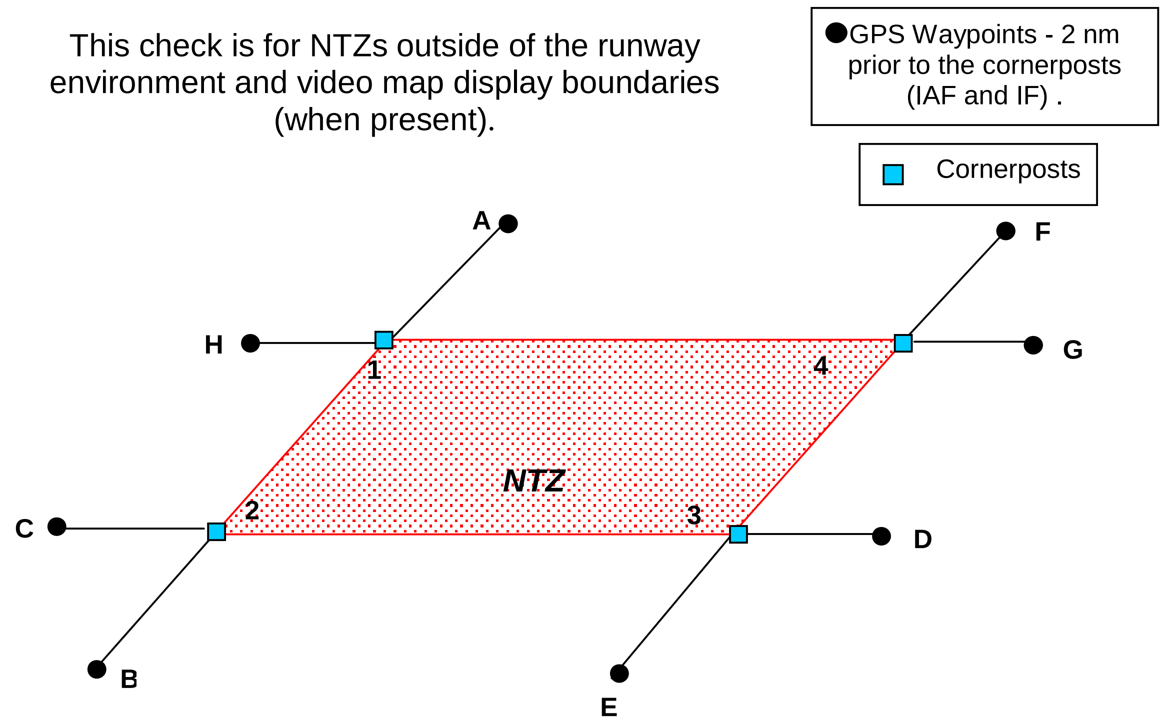
RUNWAY CENTERLINES AND NTZ WIDTH BOUNDARY CHECK (3 RUNWAYS)

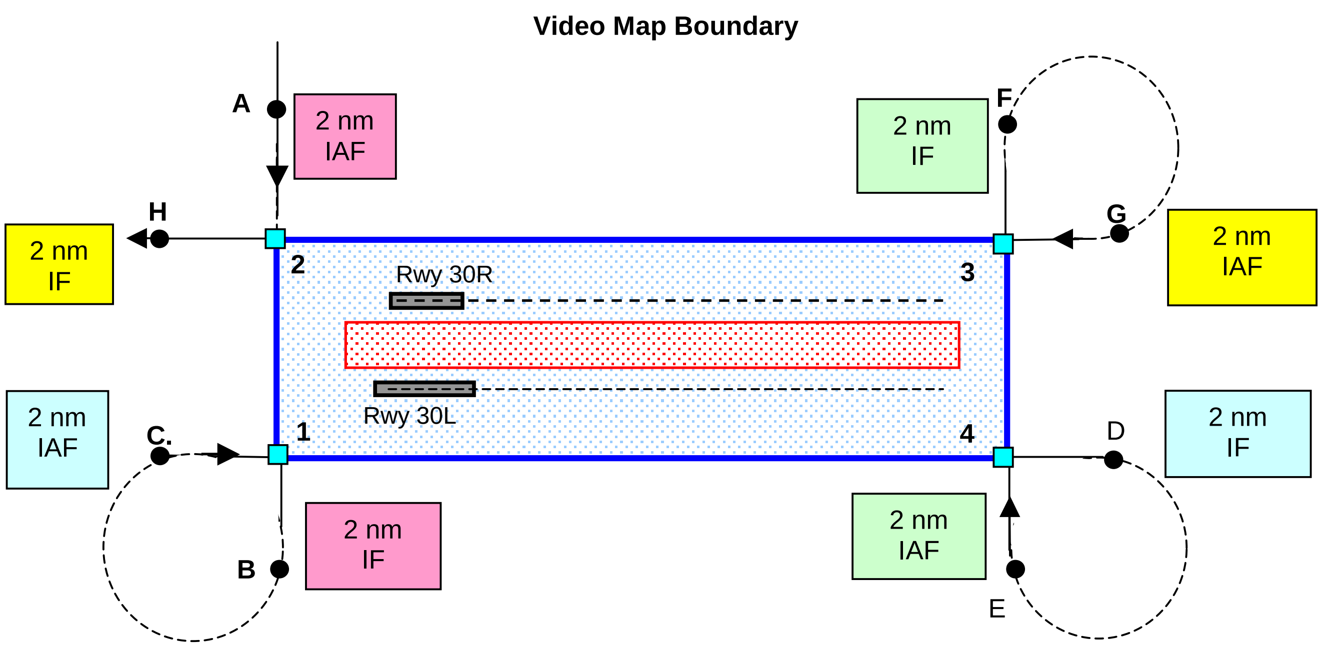


When checking triple runways, complete the procedure described in Figure 13 twice. Fly the arcs for Rwy 16 and Rwy 17R, using Rwy 16 as the “reference localizer”, then fly Rwy 17R and 17L, using Rwy 17R as the “reference localizer”. The degrees off course of each event mark will be relative to the right or “reference” localizer. This information will be provided in the PRM Excel® Workbook, following entry of appropriate facility data (see Appendix 4, Figure 1).

Figure 14

NTZ AND VIDEO MAP BOUNDARIES

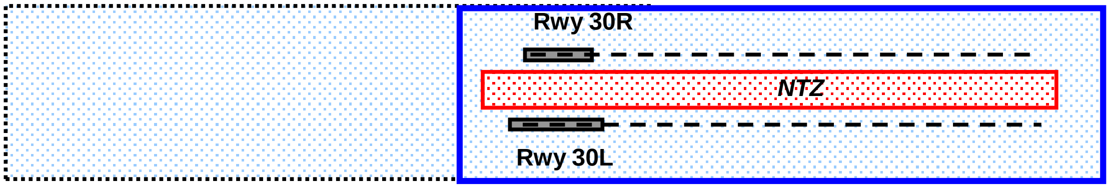




Flight plans will be entered into the GPS/FMS or GFIS airborne unit using the calculated latitude/longitudes of the points 2 nm prior and beyond the cornerposts for each leg that defines the video map or NTZ boundary. The points for each leg will be designated IAF and IF.

Figure 15

MULTIPLE VIDEO MAP DISPLAYS



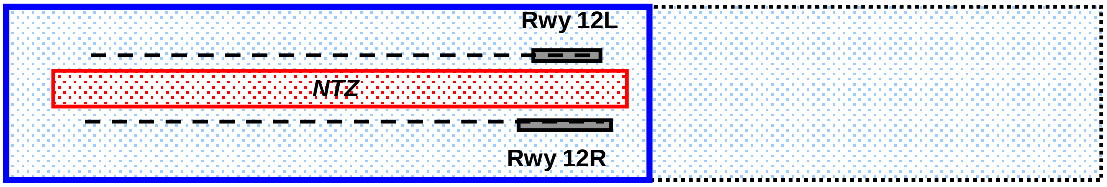
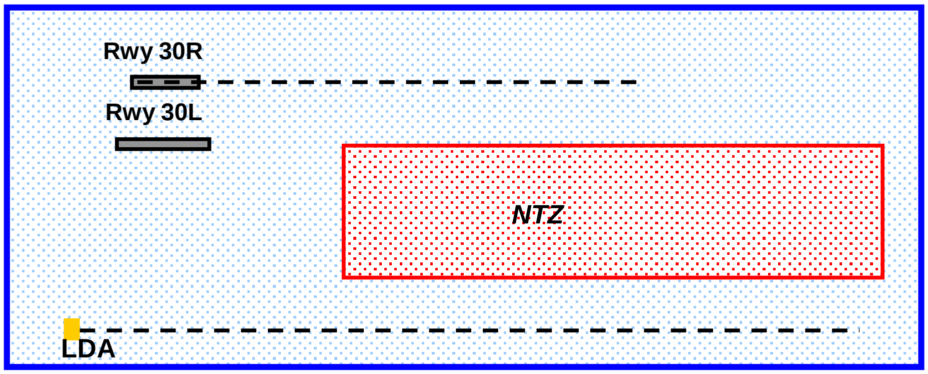


Figure 16

MULTIPLE VIDEO MAP DISPLAYS ON SAME RUNWAY END



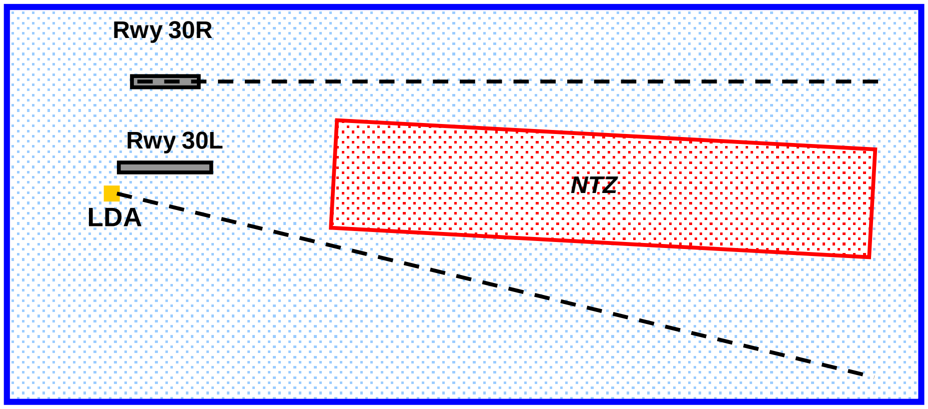
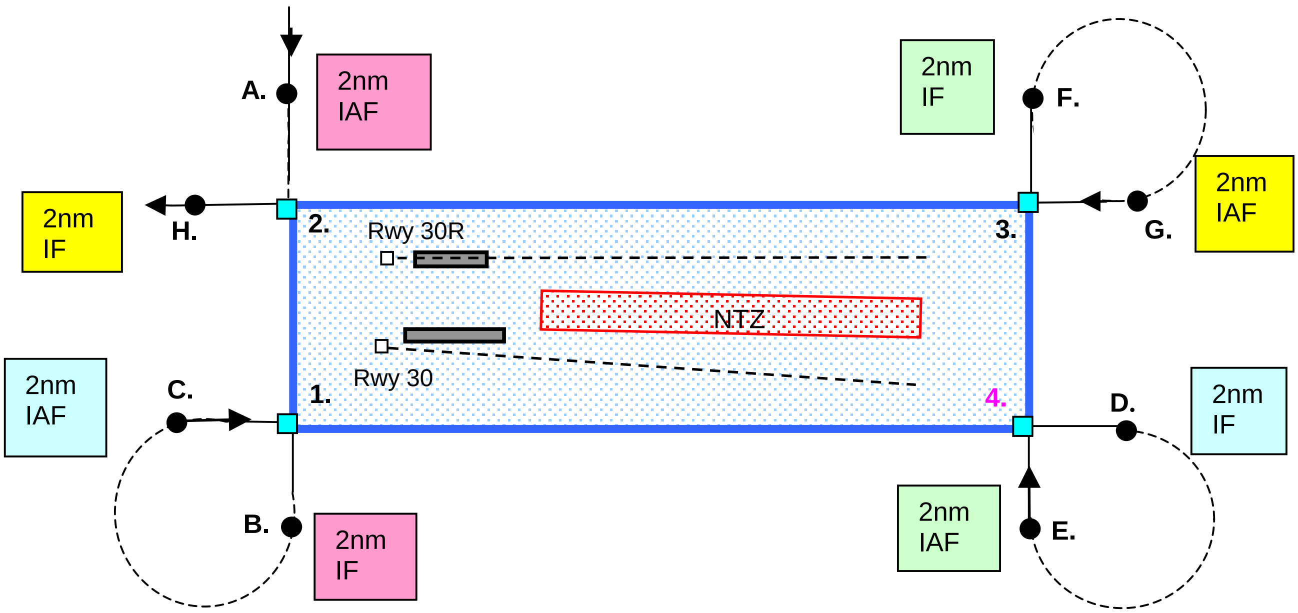


Figure 17

SIMULTANEOUS OFFSET INSTRUMENT APPROACH (SOIA)



Flight plans will be entered into the GPS/FMS or GFIS airborne unit using the calculated latitude/longitudes of the points 2nm prior and beyond the cornerposts for each leg that defines the video map. The points for each leg will be designated IAF and IF.

APPENDIX 4. PRM EXCEL® WORKBOOK

WORKBOOK INSTRUCTIONS
Facility Data Worksheet
This worksheet is for both dual and triple runways. When checking triple runways it will require facility data entry twice. Two runways will be checked at a time. Each time, the runway on the right (as looking inbound), will be the Reference runway for the evaluation. The degrees off course that are displayed in cells C25, E25, F25, and G25 are relative to the right-side Rwy entered in cells C4 - C14 and represent the expected values to be found during the ILS-1 orbits.
1. Location: Cell B1 Enter name: (city and state). **2. Runway Data:** Cells B4-B18 and C4-C18. Enter ILS facility data from AIRNAV data sheet. **3. Cell B15.** For a standard PRM this cell will have a constant value. **4. Cell B15.** For a PRM with an offset localizer or SOIA with an LDA, this value will be different for each ILS-1 distance flown. The value that must be entered into B15 may be calculated using the Offset Localizer worksheet. Following entry of the requested data into the Offset Localizer worksheet the required values needed to enter into B15 will be located in the Offset localizer worksheets pages 3 and 4. **5. Cell E2.** Enter "X" if checking a PRM. If not checking a PRM, leave blank. **6. Cell F2.** Enter "X" if checking a FMAD. If not checking a FMAD, leave blank. **7. Cell G2**. Enter the distance of the ILS-1 arc to be flown. Following entry into this cell, expected results and/or tolerances will be displayed in the blue cells.
Offset Localizer Worksheet (Page 1)
For an offset localizer or SOIA associated with a PRM, the NTZ is located equidistance between the runway final approach courses. The distance between the final approach courses is different at each distance from the reference localizer. This worksheet is provided to simplify these calculations. Enter the requested data into the Offset Localizer worksheet page 1 and the resultant distances in feet will be located in the Offset Localizer worksheet page 3 and 4.
Offset Localizer Worksheet (Page 2)
No data entry. This is part of the worksheet page 1 calculation and provides read-only information.
Offset Localizer Worksheet (Page 3)
Following entry of the required data into the Offset localizer worksheet page 1, the resultant distances in feet required for entry into the "Facility Data" worksheet cell B15 will be displayed in worksheets 3 & 4.
Offset Localizer Worksheet (Page 4)
This is a continuation of the results from the Offset Localizer Worksheet page 3.
Video or NTZ Data Worksheet (Page 1)
This worksheet is provided to calculate the latitude/longitudes of the points 2nm prior and 2nm beyond the cornerposts of the video map display or NTZ boundaries (See Appendix 3, Figure 14). These points will be entered into the GPS/FMS or GFIS airborne unit for each leg that defines the video map or NTZ boundary. The points for each leg will be identified as IAF and IF. Following data entry into this worksheet (page 1) the resultant lat/lons will be located in the Video or NTZ data worksheet pg 4.
Video or NTZ Data Worksheet (Page 2)
No data entry required. Part of "Video or NTZ Data Page 1" worksheet calculation.
Video or NTZ Data Worksheet (Page 3)
No data entry required. Part of "Video or NTZ Data Page 1" worksheet calculation.
Video or NTZ Data Worksheet (Page 4)
Following entry of the required data into the "Video or NTZ Data Page 1" worksheet, the resultant latitude and longitudes designated as IAF IF will be presented. These points will be entered into the GPS/FMS or GFIS airborne unit for each leg that defines the video map display or NTZ boundary (see Appendix 3, Figure 14 and 17).

Figure 1
Facility Data Worksheet

	A	B	C	E	F	G	H
1	1. Location :	St Louis, Mo		PRM	FMAD	ILS-1 Dist.	
2	RUNWAY DATA ENTRY BLOCK			X		5.00	
3		Left Rwy	Reference Rwy				
4	Runway number/Ident:	30L/RMK	30R/SJW				
5	TH Latitude:	38 44 16.05	38 44 19.02	Data entry required in yellow cells (except for			
6	TH Longitude:	090 20 47.28	090 20 22.52	PRM & FMAD which requires only one entry			
7	LOC Latitude:	38 45 33.46	38 45 11.43	to define whether your are checking a PRM			
8	LOC Longitude:	090 23 28.96	090 22 08.82	or an FMAD). Expected results and/or			
9	Commissioned Width	3.00	4.02	tolerances will be displayed in the blue cells.			
10							
11							
12							
13	LOC - TH Distance	14823.00	9953.00				
14	Front Course BRG	305.17	302.20				
15	Dis. Between Inbound Courses	5327.0	5327.0				
16							
17	ZONE DATA	Left Rwy	Reference Rwy				
18	WIDTH NTZ	2000	2000				
19	1/2 WIDTH NOZ	1664	1664				
20							
21							
22	30R/SJW - Ref. RWY for ILS-1 Crossing						
23	Azimuth Data		30L/RMK C/l	NTZ-L	NTZ-R	30R/SJW C/L	
24	Dis.(Ft.) from Ref. ILS		5327	3664	1664	0	
25	Degrees from Ref. ILS		10.10	6.93	3.14	0.00	
26							
27	Left Rwy/Ident		30L/RMK				
28	Ref. Rwy/Ident		30R/SJW				
29							
30							
31							
32	Dis. Of ILS-1	5.00	5.00	5.00			
33		*Normal*	*Tol. +*	*Tol. -*			
34	30L/RMK	10.10	10.47	9.72			
35	NTZ-L	6.93	7.30	6.55			
36	NTZ-R	3.14	3.52	2.76			
37	30R/SJW	0.00	0.38	-0.38			
38							
39							
40							
41	Accuracy tolerances of centerlines and NTZ Boundaries.						
42	Miles	Feet					
43	5.00	200	0.377	Degrees			

Figure 2

Offset Localizer Worksheet (Page 1)

PRM INPUT VALUES	
Location/Airport	**San Francisco, Ca**
#1 Localizer ID/Rwy/Right-side localizer	**28R/FNP**
#2 Localizer ID/Rwy/Left-side localizer	**28L/SFO**
LOCALIZER #1 IS THE REFERENCE LOCALIZER	
Localizer #1 Latitude	**373716.61**
Localizer #1 Longitude	**1222206.19**
Localizer #1 BCB	**114.79**
Localizer #2 Latitude	**373735.65**
Localizer #2 Longitude	**1222337.60**
Localizer #2 BCB	**117.80**
Following entry of the requested data above into the worksheet the resultant distances between the runways at defined distances will be displayed in the Offset Localizer worksheets Pg 3 & 4. The distance in nm from the reference localizer and corresponding dis.between inbound courses in ft will be entered into the "Facility Data" worksheet (cells G2 and B15) to complete the data entry requirements in the "Facility Data" worksheet and finalize the tolerance calculations presented in cells B34:B37, C34:C37 and E34:E37.	

Figure 3
Offset Localizer Worksheet (Page 2)

NO DATA ENTRY REQUIRED ON THIS PAGE			
Localizer ILS-1 Distance	5.00	LATITUDE at 5nm	384231.33
		LONGITUDE at 5nm	901644.47
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	6.00	LATITUDE at 6 nm	384159.28
		LONGITUDE at 6nm	901539.65
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	7.00	LATITUDE at 7nm	384127.22
		LONGITUDE at 7nm	901434.85
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	8.00	LATITUDE at 8nm	384055.15
		LONGITUDE at 8nm	901330.06
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	9.00	LATITUDE at 9nm	384023.07
		LONGITUDE at 9nm	901225.29
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	10.00	LATITUDE at 10nm	383950.98
		LONGITUDE at 10nm	901120.53
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	11.00	LATITUDE at 11nm	383918.88
		LONGITUDE at 11nm	901015.79
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		
**********			
Localizer ILS-1 Distance	12.00	LATITUDE at 12nm	383846.77
		LONGITUDE at 12nm	900911.06
Localizer #1 Latitude	384511.43		
Localizer #1 Longitude	902208.82		
Localizer #1 BCB	122.19		

Figure 4
Offset Localizer Worksheet (Page 3)

The following Dis between inbound courses and Dist-Points will be entered into B15 and G2 of Appendix 4, Figure 1, "Facility Data" worksheet to calculate the tolerance for the offset ILS or SOIA facilities.			
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 5nm	373510.54		
LONGITUDE at 5nm	1221623.54		
		Dist Between Inbound Courses (F	**3331**
Dist-Point (ILS-1 ARC)	**5nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 6 nm	373445.29		
LONGITUDE at 6nm	1221515.05		
		Dist Between Inbound Courses (F	**3651**
Dist-Point (ILS-1 ARC)	**6nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 7nm	373420.03		
LONGITUDE at 7nm	1221406.57		
		Dist Between Inbound Courses (F	**3972**
Dist-Point (ILS-1 ARC)	**7nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 8nm	373354.76		
LONGITUDE at 8nm	1221258.10		
		Dist Between Inbound Courses (F	**4293**
Dist-Point (ILS-1 ARC)	**8nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 9nm	373329.48		
LONGITUDE at 9nm	1221149.65		
		Dist Between Inbound Courses (F	**4614**
Dist-Point (ILS-1 ARC)	**9nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 10nm	373304.18		
LONGITUDE at 10nm	1221041.21		
		Dist Between Inbound Courses (F	**4934**
Dist-Point (ILS-1 ARC)	**10nm**		

Figure 5
Offset Localizer Worksheet (Page 4)

The following Dis between inbound courses and Dist-Points will be entered into B15 and G2 of Appendix 4, Figure 1, "Facility Data" worksheet to calculate the tolerance for the offset ILS or SOIA facilities.			
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 11nm	373238.88		
LONGITUDE at 11nm	1220932.78		
		Dist Between Inbound Courses (FT)	**5255**
Dist-Point (ILS-1 ARC)	**11nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 12nm	373213.57		
LONGITUDE at 12nm	1220824.37		
		Dist Between Inbound Courses (FT)	**5576**
Dist-Point (ILS-1 ARC)	**12nm**		
Localizer #2 Latitude	373735.65		
Localizer #2 Longitude	1222337.60		
Localizer #2 BCB	117.80		
LATITUDE at 13nm	373148.24		
LONGITUDE at 13nm	1220715.97		
		Dist Between Inbound Courses (FT)	**5896**
Dist-Point (ILS-1 ARC)	**13nm**		

Figure 6
Video or NTZ Data Worksheet (Page 1)

Video Map or NTZ Worksheet	
Location	St. Louis, Mo.
NTZ or Video Map	NTZ
Runway served/ILS Ident	30L/RMK 30R/SJW
Video Map or NTZ Enter corners in CCW order starting with northern most point	
Point 1 Latitude	384252.20
Point 1 Longitude	901826.10
Point 2 Latitude	384308.65
Point 2 Longitude	901811.83
Point 3 Latitude	383547.14
Point 3 Longitude	900410.22
Point 4 Latitude	383530.72
Point 4 Longitude	900424.59
Distance prior and beyond each point	2.00

From the PRM data sheet enter the NTZ or Video map information into the appropriate fields. When this page is completed, the final latitude/longitudes needed to fly the NTZ or Video Map Display boundaries will be located on the Video or NTZ Data worksheet page 4. Complete a worksheet for each NTZ and/or Video map to be checked.

Figure 7
Video or NTZ Data Worksheet (Page 2)

NO DATA ENTRY REQUIRED - INFORMATION ONLY			
Point 1	384252.20	DISTA (NM)	0.33
	901826.10	DISTA (FT)	2012.18
Point 2	384308.65	RADA	34.20
	901811.83	RADB	214.20
**********			
Point 2	384308.65	DISTA (NM)	13.22
	901811.83	DISTA (FT)	80325.42
Point 3	383547.14	RADA	123.71
	900410.22	RADB	303.86
**********			
Point 3	383547.14	DISTA (NM)	0.33
	900410.22	DISTA (FT)	2015.65
Point 4	383530.72	RADA	214.49
	900424.59	RADB	34.49
**********			
Point 4	383530.72	DISTA (NM)	13.22
	900424.59	DISTA (FT)	80320.36
Point 1	384252.20	RADA	303.86
	901826.10	RADB	123.71
**********			
LLNA LATITUDE	0.00	DISTA (NM)	0.00
LLNA LONGITUDE	0.00	DISTA (FT)	0.00
LLNA LATITUDE	0.00	RADA	0.00
LLNA LONGITUDE	0.00	RADB	0.00
**********			
LLNA LATITUDE	0.00	DISTA (NM)	0.00
LLNA LONGITUDE	0.00	DISTA (FT)	0.00
LLNA LATITUDE	0.00	RADA	0.00
LLNA LONGITUDE	0.00	RADB	0.00
**********			
LLNA LATITUDE	0.00	DISTA (NM)	0.00
LLNA LONGITUDE	0.00	DISTA (FT)	0.00
LLNB LATITUDE	0.00	RADA	0.00
LLNB LONGITUDE	0.00	RADB	0.00
**********			
LLNA LATITUDE	0.00	DISTA (NM)	0.00
LLNA LONGITUDE	0.00	DISTA (FT)	0.00
LLNB LATITUDE	0.00	RADA	0.00
LLNB LONGITUDE	0.00	RADB	0.00
**********			
LLNA LATITUDE	0.00	DISTA (NM)	0.00
LLNA LONGITUDE	0.00	DISTA (FT)	0.00
LLNB LATITUDE	0.00	RADA	0.00
LLNB LONGITUDE	0.00	RADB	0.00

Figure 8
Video or NTZ Data Worksheet (Page 3)

NO DATA ENTRY REQUIRED - INFORMATION ONLY

Dist Prior to Pt 1	2.00	2nm Prior to Pt 1	384112.85
			901952.25
Point 1 Latitude	384252.20		
Point 1 Longitude	901826.10		
RAD B from INV83	214.20		
********************			
Dist Beyond Pt 2	2.00	2nm Beyond to Pt 2	384447.99
			901645.62
Point 2 Latitude	384308.65		
Point 2 Longitude	901811.83		
RAD A from INV83	34.20		
********************			
Dist Prior to Pt 2	2.00	2nm prior to Pt 2	384415.56
			902019.19
Point 2 Latitude	384308.65		
Point 2 Longitude	901811.83		
RAD B from INV83	303.86		
********************			
Dist Beyond Pt 3	2.00	2nm Beyond to Pt 3	383440.45
			900202.93
Point 3 Latitude	383547.14		
Point 3 Longitude	900410.22		
RAD A from INV83	123.71		
********************			
Dist Prior to Pt 3	2.00	2nm prior to Pt 3	383726.14
			900243.51
Point 3 Latitude	383547.14		
Point 3 Longitude	900410.22		
RAD B from INV83	34.49		
********************			
Dist Beyond Pt 4	2.00	2nm Beyond to Pt 4	383351.70
			900551.23
Point 4 Latitude	383530.72		
Point 4 Longitude	900424.59		
RAD A from INV83	214.49		
********************			
Dist Prior to Pt 4	2.00	2nm prior to Pt 4	383424.03
			900217.31
Point 4 Latitude	383530.72		
Point 4 Longitude	900424.59		
RAD B from INV83	123.71		
********************			
Dist Beyond Pt 1	2.00	2nm Beyond to Pt 1	384359.11
			902033.45
Point 1 Latitude	384252.20		
Point 1 Longitude	901826.10		
RAD A from INV83	303.86		
	0.00		0.00
	0.00		0.00

Figure 9

Video or NTZ Data Worksheet (Page 4)

Latitude/Longitude Used for NTZ or Video Map Boundary Check			
2nm Prior to Pt 1	**384112.85**	**DIS IAF to IF**	**4.33**
or **Pt. A (IAF)**	**901952.25**	DISTA (FT)	26316.58
2nm Beyond Pt 2	**384447.99**	RADA	34.18
or **Pt. B (IF)**	**901645.62**	RADB	214.22
**			
2nm Prior to Pt 2	**384415.56**	**DIS IAF to IF**	**17.22**
or **Pt. C (IAF)**	**902019.19**	DISTA (FT)	104629.74
2nm Beyond Pt 3	**383440.45**	RADA	123.69
or **Pt. D (IF)**	**900202.93**	RADB	303.88
**			
2nm Prior to Pt 3	**383726.14**	**DIS IAF to IF**	**4.33**
or **Pt. E (IAF)**	**900243.51**	DISTA (FT)	26320.05
2nm Beyond Pt 4	**383351.70**	RADA	214.51
or **Pt. F (IF)**	**900551.23**	RADB	34.47
**			
2nm Prior to Pt 4	**383424.03**	**DIS IAF to IF**	**17.22**
or **Pt. G (IAF)**	**900217.31**	DISTA (FT)	104624.68
2nm Beyond Pt 1	**384359.11**	RADA	303.88
or **Pt. H (IF)**	**902033.45**	RADB	123.69
**			

APPENDIX 5. FLIGHT INSPECTION REPORT – PRECISION RUNWAY MONITOR/FINAL MONITOR AID DISPLAY, FAA FORM 8240-5-4

This report shall be used for reporting all site, commissioning, periodic, special, and other inspections.

a. Field 1 – Location. Complete as shown in Chapter 2, Paragraph 12 of the current edition of
FAA Order 8240.36, Instructions for Flight Inspection Reporting.

b. Field 2 – Ident. Enter the airport ident.

c. Fields 3 - 5. Complete as shown in Chapter 2, Paragraph 12 of the current edition of FAA Order 8240.36, Instructions for Flight Inspection Reporting.

d. Field 6 – Approach Data:

(1) Runway/Ident. Enter the runway number and ident of the ILS facility serving the PRM/FMAD approach being inspected.

(2) Modes/Codes. Satisfactory when each code generates the proper alert in the appropriate alarm field of the track data block. If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an “X” in the “UNSAT” space and explain in Field 7.

(3) Transponder Check. Satisfactory when the monitor controller verifies the proper alert "CST" is detected and displayed in the track data block. If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an “X” in the “UNSAT” space and explain in Field 7.

(4) Usable Distance. Satisfactory when there is no loss of track throughout the service volume, as defined by the site specific video map display boundary, and meets ATC requirements. If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7.

(5) Inbound Courses and NTZ Boundary. Satisfactory if within ± 200 ft of the desired boundary or centerline position. If satisfactory, place an "X" in the "SAT" space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7.

(6) Altitude Boundary. Satisfactory if within ± 125 ft of the desired coverage altitude. If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7.

(7) Video Map Display (VMD) and NTZ Boundary(ies) (not located within the runway environment). Satisfactory if within ± 500 ft of the desired boundary position. If satisfactory, place an "X" in the "SAT" space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7.

(8) Approach/Missed Approach. Satisfactory when fixes are displayed accurately on the video map, as determined by the pilot from the monitor controller reports and the localizer alignment, and the monitor controller provided centerline marks are comparable (within $\pm$ 15 μA). If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7.

(9) Low Altitude Coverage. Satisfactory when there is no loss of track throughout the runway environment (threshold to runway end). If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7. (Refer to Appendix 1, Page 9, Tolerances).

(10) Communications. Satisfactory when override capability provides ability to transmit message that is clear and readable. If satisfactory, place an “X” in the “SAT” space. If unsatisfactory, place an ”X” in the “UNSAT” space and explain in Field 7.

(11) Approach Status. If unrestricted, place an “X” in the “SAT” space. If restricted, place an “X” and an “*” in the “SAT” space and explain in Remarks, Field 7. If unusable, place an “X” in the “UNSAT” space and explain in Field 7. Any restriction here shall incur a restriction in facility status (paragraph f).

e. Field 7 – Remarks. Complete as shown in Chapter 3, Paragraph 21 of the current edition of FAA Order 8240.36, Instructions for Flight Inspection Reporting. Additionally, if the low altitude coverage for a Category I facility is satisfactory at 100 ft but not at 50 ft, enter a remark in this field. Include this information in the Remarks field of the facility data sheet. If there are one or more NTZ’s that are not located between the runways, enter a description of each, using latitude/longitudes, or a name if one is designated by engineering or maintenance. Following the description of each NTZ checked, indicate whether the boundaries are satisfactory, using “SAT” or unsatisfactory “UNSAT”. If unsatisfactory, explain why.

f. Facility Status. Complete as shown in Chapter 2, Paragraph 12 of the current edition of FAA Order 8240.36, Instructions for Flight Inspection Reporting.

g. NOTAM’s. Complete as shown in Chapter 3, Paragraph 21 of the current edition of FAA Order 8240.36, Instructions for Flight Inspection Reporting.

FLIGHT INSPECTION REPORT – PRECISION RUNWAY MONITOR/ FINAL MONITOR AID DISPLAY, FAA FORM 8240-5-4

FLIGHT INSPECTION REPORT-- PRM/FMAD						REVIEW INITIALS
1. LOCATION:						2. IDENT:
3. OWNER:	4. DATE(S) OF INSPECTION:					
5. TYPE OF INSPECTION		COMMISSIONING		SURVEILLANCE		INCOMPLETE
		PERIODIC		SPECIAL		

6. APPROACH DATA

RUNWAY/IDENT												
[redacted]	SAT	UNSAT	SAT	UNSAT	SAT	UNSAT	SAT	UNSAT	SAT	UNSAT	SAT	UNSAT
MODES/CODES												
TRANSPONDER CHECK												
USABLE DISTANCE												
RWY INBOUND COURSE & NTZ WIDTH BOUNDARY												
ALTITUDE BOUNDARY												
VMD AND/OR NTZ BOUNDARY(IES)												
APCH/MISSED APCH												
LOW ALTITUDE COVERAGE												
COMMUNICATIONS												
APPROACH STATUS												

7. REMARKS:

FACILITY STATUS		NOTAMs:		
UNRESTRICTED				
RESTRICTED				
UNUSABLE				
REGION:		FLIGHT INSPECTOR 'S SIGNATURE:	TECHNICIAN 'S SIGNATURE:	AIRCRAFT NO:

FAA FORM 8240 - 5 - 4 (8/2002) (FORMFLOW)